FIRE DYNAMICS ANALYSTS

GREGORY E. GORBETT

330 Eastern Bypass, Suite 1, PMB#231 • Richmond, Kentucky 40475 • Cell: 859-353-2945
E-mail: Greg@FDAfire.com   www.fdafire.com

RESEARCH INTERESTS

Fire and explosion investigation and analysis; Enclosure fire dynamics and fire behavior via residential scale and small-scale experimentation; Residential and commercial fuel gas systems and explosions; Fire science and its application to building codes, building construction, fire protection and forensics; Failure analysis and electrical fire causation; Mathematical modeling and computer simulation of fires in buildings; engineering forensic tools; and the use of computer fire models in fire investigation, reconstruction and protection.

EDUCATION

Ph.D., Fire Protection Engineering, Worcester Polytechnic Institute, Worcester, MA – Summer 2015 (4.0 GPA/4.0)

M.S., Fire Protection Engineering, Worcester Polytechnic Institute, Worcester, MA- Spring 2010, (4.0 GPA/4.0)

M.S., Executive Fire Service Leadership, Grand Canyon University, Phoenix, AZ, 2007, (4.0 GPA/4.0)

B.S., Fire Science, University of Maryland University College, Adelphi, MD, 2005, (4.0 GPA/4.0)

B.S. *Hons*, Forensic Science, Tri-State University, Angola, IN, Minors: Chemistry and Criminal Justice, 2003, (3.63 GPA/4.0)

SPECIALIZED UNIVERSITY STUDIES

Seneca College, Fire Protection Engineering Technology, Ontario, Canada, 2004
- Fire Dynamics Simulator FDS 693

University of South Florida, Mechanical Engineering, Tampa, Florida, 2005-2006 (4.0 GPA/4.0)
- Calculus I-III
- Differential Equations
- Thermodynamics
- Fluid systems
- Heat Transfer

National Fire Academy, United States Fire Administration (4.0 GPA/4.0):
- Political and Legal Foundations of Fire Protection
- Fire Prevention Organization and Management
- Managerial Issues in Hazardous Materials
- Advanced Fire Administration
- Fire Dynamics
- Incendiary Fire Analysis and Investigation

EXHIBIT E

GREGORY E. GORBETT

PROFESSIONAL EXPERIENCE

PROFESSOR – FIRE & SAFETY ENGINEERING TECHNOLOGY
Eastern Kentucky University, Richmond, KY, 2008-Present

Responsible for teaching and instructing on various fire protection engineering technology courses at the undergraduate level. Specializing in the instruction and curriculum development for fire science, fire and explosion investigation, failure analysis, and fire protection systems courses.

OWNER / SENIOR FIRE AND EXPLOSION ANALYST
Fire Dynamics Analysts, Richmond & Louisville, KY; Fort Wayne, IN; 2017-Present

Responsible for conducting fire and explosion investigations, conducting failure analysis, providing fire and explosion litigation support, and utilizing computer fire modeling including both zone models and computational fluid dynamics (CFD). Litigation experience includes both criminal and civil cases involving explosions, residential, commercial, industrial, vehicle, machinery, and appliance fires. Evaluated other investigators' fire and explosion investigations, analyses, and computer fire models for accuracy and competency.

FIRE AND EXPLOSION ANALYST - PRINCIPAL EXPERT
Gorbett and Associates, Richmond, KY, 2008-2017

Responsible for conducting fire and explosion investigations, conducting failure analysis, providing fire and explosion litigation support, and utilizing computer fire modeling including both zone models and computational fluid dynamics (CFD). Litigation experience includes both criminal and civil cases involving explosions, residential, commercial, industrial, vehicle, machinery, and appliance fires. Evaluated other investigators' fire and explosion investigations, analyses, and computer fire models for accuracy and competency.

FIRE AND EXPLOSION ANALYST - ASSOCIATE EXPERT
John A. Kennedy and Associates, Sarasota, FL, 2003-2009

Responsible for conducting fire and explosion investigations and fire hazards analysis, conducting failure analysis, providing fire litigation support, and utilizing computer fire modeling including both zone models and computational fluid dynamics (CFD). Litigation experience includes both criminal and civil cases involving residential, commercial, and industrial fires and explosions. Conducted various site fire investigations that cover a wide range of structural settings including residential, commercial, and industrial facilities. Conducted fire investigations in various vehicles including commercial vehicles, passenger vehicles, and heavy equipment. Skilled in all the aspects of fire and explosion scene examination; determining the origin, cause, and responsibility for fire and explosion incidents and the damage, injuries and deaths which result; implementation of fire protection elements to mitigate losses; forensic fire science and technology laboratory examinations of fire evidence, and fire and safety code research. Evaluated other investigators' fire and explosion investigations for accuracy and competency.

Selected Contributions:
- ✓ Successfully maintained and increased client base by applying fire science principles to fire and explosion investigations.
- ✓ Managed successful implementation of computer fire modeling programs for fire investigations and analyses.
- ✓ Personally investigated and analyzed over 150 fire and explosion incidents, including some of the most recent large-scale explosion incidents in the United States.

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FIRE AND EXPLOSION INVESTIGATOR
Donan Engineering, Evansville, IN, 2003-2003

Responsible for conducting fire and explosion investigations and failure analyses. Conducted various site fire investigations that cover a wide range of structural settings including residential, commercial, and industrial facilities.

Selected Contributions:

- ✓ Implemented systematic methodology of investigating fires.
- ✓ Investigated and analyzed over 25 fire incidents.

FIRE AND EXPLOSION INVESTIGATION INTERN
Kodiak Enterprises, Fort Wayne, IN, 2001-2003

Responsible for assisting in fire and explosion investigations and failure analyses. Assisted in determining the origin, cause, and responsibility of fires and explosions in a variety of structural settings, including residential, commercial and industrial facilities. Assisted with failure analysis specifically related to electrical fire causes. Assisted with code review of electrical and building code violations. Assisted in the evaluation of fire and explosion investigations for accuracy and competency.

Selected Contributions:

- ✓ Assisted with over 30 fire incidents, including the largest single-family house fire in history.
- ✓ Created an evidence database and standard operating procedures for more efficient evidence collection and preservation.

FIRE SERVICE EXPERIENCE AND TRAINING

Volunteer firefighter for several departments in Indiana. Most recently, a member of the Angola Volunteer Fire Department as a Paid-On-Call firefighter. Responsibilities have included providing fire suppression and rescue activities. Successfully completed 24-hour mandatory firefighter training. Successfully completed over 40 hours of in-class training and 20 hours of practical skills training towards firefighter I & II certifications.

───── PROFESSIONAL REGISTRATION/CERTIFICATION ─────

CERTIFIED FIRE AND EXPLOSION INVESTIGATOR (CFEI)
National Association of Fire Investigators, No. 8886-3960

CERTIFIED FIRE INVESTIGATION INSTRUCTOR (CFII)
National Association of Fire Investigators, No.8886-3960I

CERTIFIED VEHICLE FIRE INVESTIGATOR (CVFI)
National Association of Fire Investigators, No. 8886-3960V

CERTIFIED FIRE PROTECTION SPECIALIST (CFPS)
National Fire Protection Association, No. 2374.

CERTIFIED FIRE INVESTIGATOR (IAAI-CFI)
International Association of Arson Investigators, No. 09-088.

24 HOUR MANDATORY/BASIC FIREFIGHTER
IFSAC Certification, No. 51900

KENTUCKY AND MICHIGAN PRIVATE INVESTIGATOR
License, KY-No. 0628 ; MI-No. 3701206470

GREGORY E. GORBETT

PROFESSIONAL STANDING

MEMBERSHIPS:

Member, American Society for Testing and Materials (ASTM)
Member (MIFireE), Institution of Fire Engineers (IFE)
Member, International Association of Arson Investigators (IAAI)
Director, National Association of Fire Investigators (NAFI) – Board of Directors (2004-2017)
Member, National Fire Protection Association (NFPA)
Chairman, NFPA Fire Science and Technology Educators' Section - Executive Board (2006-2015)
Member, Society of Fire Protection Engineers (SFPE)

COMMITTEES:

Member, Technical Committee on Fire Investigator Professional Qualifications–NFPA 1033
(2004-2014; 2016-present)
Member, Technical Committee on Fire and Explosion Investigations – NFPA 921 (2014-2018)
Executive Secretary, Crime Scene/Death Investigation Scientific Area Committee's (SAC's) Fire Scene
and Explosives Subcommittee within the Organization of Scientific Area Committees (OSAC)
through the National Institute of Standards and Technology (NIST) [2018-2020]
Member, International Fire Service Training Association (IFSTA) Validation Committee for *IFSTA
Fire Investigator* Training Manual
Past Chairman, NFPA Fire Science and Technology Educator's Section – Executive Board
Vice-Chair, International Association of Arson Investigators (IAAI) *Fire & Arson Investigator*: Journal
of the International Association of Arson Investigators (2012-2019)
Member, Certified Fire Investigator (IAAI-CFI) Committee – International Association of Arson
Investigators
Member, Texas Scientific Advisory Work Group (SAWG). (2020-Present)
Member, Society of Fire Protection Engineers (SFPE) Academic Leadership Council, (2021-Present)

SELECTED PRESENTATIONS AND PUBLICATIONS

PUBLICATIONS:

Kennedy, P., **Gorbett, G**., Kennedy, K. (2003). *A Fire Analysis Tool Revisited - Acoustic Soot
Agglomeration in Residential Smoke Alarms.* Investigations Institute: Sarasota, Florida.
Gorbett, G., Kennedy, P., Kennedy, K. (2004). *Outgassing Phenomena in Flash Point Testing for Fire
Safety Evaluation*. Interflam Tenth International Fire Science and Engineering Conference at
Heriot-Watts University: Edinburgh, Scotland.
Kennedy, P., **Gorbett, G.**, Kennedy, K. (2004). *A Fire Analysis Tool Revisited - Acoustic Soot
Agglomeration in Residential Smoke Alarms.* Interflam Tenth International Fire Science and
Engineering Conference at Heriot-Watts University: Edinburgh, Scotland.
Gorbett, G. (2004). *Fire Dynamic Simulator (FDS) and Smokeview Training.* National Fire
Protection Association (NFPA) in *Fire News*: Quincy, MA.
Gorbett, G. (2005). *Letter to the Editor: Flashover and Backdraft.* Fire Engineering: Tulsa, OK.
Kennedy, P., **Gorbett, G.**, (2006). *Advanced Fire Pattern Research Project.* British Fire Service
College/Institution of Fire Engineers Annual Conference: Fire Related Research and
Developments: Moreton-in-Marsh, England.
Gorbett, G., Kennedy, P., Hopkins, R., Hicks, W. (2006). *Full Scale Room Burn Pattern Study.* 2nd
International Symposium on Fire Investigation Science and Technology, at the University of
Cincinnati.
Hicks, W., **Gorbett, G**., Hopkins, R., Kennedy, P., Abney, B. (2006). *Advanced Fire Pattern Research
Project,"* presented at the 2nd International Symposium on Fire Investigation Science and
Technology, at the University of Cincinnati.

Gorbett, G., Hopkins, R., Kennedy, P. (2006). *Full Scale Room Burn Pattern Study.* National Fire Investigator: National Association of Fire Investigators, Spring Edition.

Hopkins, R., **Gorbett, G.** (2007). *Fire Pattern Persistence and Predictability on Interior Finish and Construction Materials during Pre and Post Flashover Compartment Fires.* Fire and Materials-10th annual international Conference: San Francisco, CA.

Gorbett, G., Hopkins, R. (2007). *The Current Knowledge and Training Regarding Flashover, Backdraft and other Rapid Fire Progression Phenomena.* NFPA: Boston, MA.

Gorbett, G. (2008). Plenary Paper: *Computer Fire Modeling for Fire Investigations.* International Symposium on Fire Investigation, at the University of Cincinnati.

Hopkins, R., **Gorbett, G.** (2009). *Fire Pattern Persistence and Predictability on Interior Finish and Construction Materials during Pre and Post Flashover Compartment Fires.* Fire and Materials-10th annual international Conference: San Francisco, CA.

Gorbett, G., Meacham, B., and Wood, C. (2010). Plenary Paper: *Development and Assessment of a Decision Support Framework for Enhancing the Forensic Analysis and Interpretation of Fire Patterns.* International Symposium on Fire Investigation, at the University of Maryland.

Gorbett, G., Hicks, W., and Kennedy, P. (2010). *Fire Patterns Analysis with Low Heat Release Rate Initial Fuels.* International Symposium on Fire Investigation, at the University of Maryland.

Icove, D., **Gorbett, G.**, Birdwell, J., and Merck, R. (2010). *Fire Modeling: Best Practices for Constructing Academic High Performance Computing Clusters.* International Symposium on Fire Investigation, at the University of Maryland.

Gorbett, G. (2011). *Computer Fire Modeling for Fire Investigations.* Journal of Canadian Association of Fire Investigators. Vol. 1.

Tinsley, A., **Gorbett, G.** (2012). Plenary Paper: *Fire Investigation Origin Determination Survey.* International Symposium on Fire Investigation, at the University of Maryland.

Tinsley, A., **Gorbett, G.** (2013). *Fire Investigation Origin Determination Survey.* Fire & Arson Investigator: Journal of the International Association of Arson Investigators.

Gorbett, G., Tinsley, A., and Hicks, W. (2013). *Fire Patterns Analysis with Low Heat Release Rate Initial Fuels.* Fire & Arson Investigator: Journal of the International Association of Arson Investigators.

Gorbett, G. and Chapdelaine, W. (2014). *Scientific Method-Use, Application, and Gap Analysis for Origin Determination.* International Symposium of Fire Investigations.

Gorbett, G., Morris, S., Meacham, B., and Wood, C. (2015). *A New Method for the Characterization of the Degree of Fire Damage to Gypsum Wallboard for Use in Fire Investigations.* Journal of Forensic Sciences, January.

Gorbett, G., Meacham, B., Wood, C., and Dembsey, N. (2015). *Use of Damage in Fire Investigation: A review of fire pattern analysis, research and future direction.* Fire Science Reviews Journal, **4**:4

Gorbett, G., Meacham, B., Wood, C., and Dembsey, N. (2015). *Structure and Evaluation of the Process for Origin Determination (POD) in Compartment Fire.* Fire Technology, Manuscript FIRE-D-15-00228

Kozhumal, S., **Gorbett, G.**, (2018). *Fire Dynamics and Forensic Analysis of Compartment Fires.* Eastern States Section of the Combustion Institute-Spring Technical Meeting, Penn State University.

Beyler, C., **Gorbett, G.**, Lentini, J. (2019). Response to Member Feedback on Interpretation of the Publications Improving the Understanding of Post-Flashover Fire Behavior and Progressive Burn Pattern Development in Post-Flashover Fires by Steven Carman. Vol. 70, April 2019.

Fowlie, E., Sezer, H., **Gorbett, G.**, & Kozhumal, S., (2020). *Numerical Investigation of Heat Transfer and Gypsum Calcination Under Fire Conditions.* Eastern States Section of the Combustion Institute-Spring Technical Meeting, University of South Carolina.

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Fowlie, E., Borth, T., **Gorbett, G.,** Sezer, H., Kozhumal, S. (2021). *Experimental and Numerical Investigation of Gypsum Calcination under Fire Exposure.* 12th US National Combustion Meeting, Central States Section of the Combustion Institute, College Station, TX.

Kozhumal, S., **Gorbett, G.** (2022). *Development, Training, and Testing of an Artificial Intelligence Model for Fire Detection.* Eastern States Section of the Combustion Institute-Spring Technical Meeting, Florida

Sezer, H., Paye, R., Geist, C., Fries, H., Borth, T., **Gorbett, G**., Kozhumal, S. (2022). *TGA, DSC, and FTIR Analysis of Gypsum Plasterboards Under Varying Heating Rates.* Eastern States Section of the Combustion Institute-Spring Technical Meeting, Florida

Gorbett, G., Borth, T., Rainey, S., Hicks, W. (2022). *Identifying Thresholds for Observational Indicators of Enhanced Sonic Deposition on Smoke Alarms in Forensic Investigations.* Fire Technology; https://doi.org/10.1007/s10694-022-01283-6

Gorbett, G., Kozhumal, S. (2022). *The Identification of Lines of Demarcation for Use in Analyzing Fire Damage through Digital Image Processing and Artificial Intelligence.* Accepted for publication in the Journal of Fire and Arson Investigator, International Association of Arson Investigators.

Hasnain, M., Paye, R., Casa, J., Borth, T., **Gorbett, G.,** Kozhumal, S., Sezer, H. (2023). *3D Mathematical Model for Heat and Mass Transfer Mechanisms in Gypsum Board Exposed to Fire.* 13th US National Combustion Meeting, Central States Section, College Station, TX.

Kozhumal, S., **Gorbett, G.,** Sezer, H., Borth, T. (2024). Experimental and numerical investigations for the prediction of depth of calcination of gypsum plasterboards under fire exposure. https://nij.ojp.gov/funding/awards/2020-r2-cx-0050

TEXTBOOK

Gorbett, G., Pharr, J. (*2010*). **Fire Dynamics**. 1st Edition. Brady/Prentice Hall: Upper Saddle River, NJ.

Gorbett, G., Pharr, J., Rockwell, S (2015). **Fire Dynamics**. 2nd Edition, Brady/Prentice Hall: Upper Saddle River, NJ.

Dunlap, S., editor (2012). **The Comprehensive Handbook on School Safety**. CRC Publishers, Boca Raton, FL. Co-authored Chapter 12: Fire Hazards, Chapter 13: Fire Protection Systems, Chapter 14: Life Safety

Meacham, B., editor (2022). **Environmental Impact of Fire Handbook**, "Chapter 8-Fire Fundamentals," Springer: New York, NY

GRANT ADMINISTRATION

Lancaster, T., Meadors, A. (2012). *Preliminary Analysis of Energized and Non-Energized Multi-strand Copper Wire with Three Full-Scale Compartment Fires.* International Symposium on Fire Investigation, at the University of Maryland. – $10,000 Funded through Justice and Safety Program of Distinction (JUSPOD)

Hanks, C., Gorbett, G., Knoll, D. (2012). Ignition Potential of Common Fuels by Residential Electric Range Cooktops. $12,000 funded through the Institute of Fire Engineers (IFE-USA) and Vision 20/20. Report available at http://strategicfire.org/technology/cooking/

Barnott, A., Hardman, R., Hoff, N. (2013). *An Improved Method for Measuring Depth of Calcination in Fire Investigations.* International Association of Arson Investigators. $8,000 funded through Justice and Safety Program of Distinction (JUSPOD)

Kozhumal, S., Gorbett, G. (2021). *Experimental and numerical investigations for the prediction of depth of calcination of gypsum plasterboards under fire exposure.* $251,000 Funded through the National Institute of Justice (NIJ).

Kozhumal, S., Gorbett, G. (2024). *Experimental and numerical investigations for the development and validation of thermo-chemistry models and property databases for selected wall lining materials under fire exposure.* $290,289 Funded through the National Institute of Justice (NIJ).

TEXTBOOK PEER REVIEW AND ASSISTANCE

Icove, D., DeHaan, J. (*2008 / 2012*). **Forensic Fire Scene Reconstruction**. 2nd & 3rd Editions. Brady/Prentice Hall: Upper Saddle River, NJ.

International Fire Service Training Association (IFSTA). (2008). **IFSTA Fire Investigator.** 2nd Edition. IFSTA, Oklahoma State University: Stillwater, OK.

Principles of Fire Protection Chemistry and Physics. (2010). Jones & Bartlett Publishers.

DeHaan, J. (2010). **Kirk's Fire Investigation**. 7th Edition. Brady/Prentice Hall: Upper Saddle River, NJ.

PRESENTATIONS:

Gorbett, G. (2003) *Importance of Documentation for Fire Investigators.* American Criminal Justice Association (ACJA) Criminal Justice Symposium. Tri-State University: Angola, IN.

Gorbett, G. (2003). *Staff Instructor*. Vehicle Fire, Arson, & Explosion Investigation Science & Technology Seminar. Eastern Kentucky University: Richmond, KY.

Gorbett, G., Hopkins, R. (2004). *Computer Fire Modeling Course.* Eastern Kentucky University and National Association of Fire Investigators (NAFI). National Advanced Fire, Arson, and Explosion Investigation Science and Technology Program. Eastern Kentucky University: Richmond, KY.

Kennedy, P., **Gorbett, G.** (2004). *Flashover and Fire Analysis – A Discussion of the Practical Use of Flashover Analysis.* National Fire Protection Association (NFPA): Salt Lake City, UT.

Gorbett, G. (2004). *The Importance of Smoke Alarms in Today's Society*. Sarasota Optimist Club: Sarasota, FL.

Gorbett, G., Kennedy, P. (2004). *Computer Fire Modeling Course.* National Fire, Arson & Explosion Investigation One day Pre-Program Seminar. National Association of Fire Investigators (NAFI) and National Fire Protection Association (NFPA): Sarasota, FL.

Kennedy, P., **Gorbett, G.** (2004). *Importance of Computer Fire Modeling in Fire Investigations.* National Fire, Arson & Explosion Investigation Pre-Program Seminar. National Association of Fire Investigators (NAFI) and National Fire Protection Association (NFPA): Sarasota, FL.

Gorbett, G. (2004). *Searching, Note Taking an d Documenting the Fire Scene.* National Fire, Arson & Explosion Investigation Training Program. National Association of Fire Investigators (NAFI) and National Fire Protection Association (NFPA): Sarasota, FL.

Gorbett, G. (2004). *Staff Instructor*. Vehicle Fire, Arson, & Explosion Investigation Science & Technology Seminar. Eastern Kentucky University and National Association of Fire Investigators (NAFI): Richmond, KY.

Gorbett, G., Hopkins, R. (2005). *Computer Fire Modeling Course.* National Advanced Fire, Arson, and Explosion Investigation Science and Technology Program. Eastern Kentucky University and National Association of Fire Investigators (NAFI): Richmond, KY.

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Gorbett, G. (2005). *Searching, Note Taking and Documenting the Fire Scene.* National Fire, Arson & Explosion Investigation Training Program. National Association of Fire Investigators (NAFI) and National Fire Protection Association (NFPA): Sarasota, FL.

Gorbett, G. (2005). *Computer Fire Modeling Course.* National Fire, Arson & Explosion Investigation One day Pre-Program Seminar. National Association of Fire Investigators (NAFI) and National Fire Protection Association (NFPA): Sarasota, FL.

Gorbett, G. (2005). *Flashover, Backdraft, Smoke Explosions and Other Fire Dynamic Phenomena.* East Manatee Fire Department: Lakewood Ranch, FL.

Gorbett, G. (2005). *Staff Instructor.* Vehicle Fire, Arson, & Explosion Investigation Science & Technology Seminar. National Association of Fire Investigators (NAFI) and Eastern Kentucky University: Richmond, KY.

Gorbett, G., Hopkins, R. (2006). *Computer Fire Modeling Course.* National Advanced Fire, Arson, and Explosion Investigation Science and Technology Program. Eastern Kentucky University and National Association of Fire Investigators (NAFI): Richmond, KY.

Gorbett, G. (2006). *Searching, Note Taking, Photographing and Documenting the Fire Scene.* 20th Annual Fire Investigation Training Program. International Association of Arson Investigators (IAAI) Rhode Island Chapter: Newport, RI.

Gorbett, G. (2006). *Origin Determination.* 20th Annual Fire Investigation Training Program. International Association of Arson Investigators (IAAI) Rhode Island Chapter: Newport, RI.

Gorbett, G. (2006). Member of Expert Panel for the *Expert Seminar on Fire Patterns*. 2nd International Symposium on Fire Investigation Science and Technology. University of Cincinnati: Cincinnati, OH.

Gorbett, G. (2006). *Full-Scale Room Burn Pattern Study.* 2nd International Symposium on Fire Investigation Science and Technology. University of Cincinnati: Cincinnati, OH.

Gorbett, G. (2006). *Computer Fire Modeling Course.* National Fire, Arson & Explosion Investigation One day Pre-Program Seminar. National Association of Fire Investigators (NAFI) and National Fire Protection Association (NFPA): Sarasota, FL.

Gorbett, G. (2007). *Fire Protection Chemistry and Fire Dynamics.* Carroll County Arson Task Force Fire Investigation Seminar. Carroll County Fire Investigation Division: Delphi, IN.

Gorbett, G. (2007). *Origin Determination.* Carroll County Arson Task Force Fire Investigation Seminar. Carroll County Fire Investigation Division: Delphi, IN.

Gorbett, G. (2007). *Computer Fire Modeling Course.* National Advanced Fire, Arson, and Explosion Investigation Science and Technology Program. Eastern Kentucky University and National Association of Fire Investigators (NAFI): Richmond, KY.

Gorbett, G., Hopkins, R. (2007). *Backdraft, Flashover, and other Rapid Fire Progression Phenomena.* NFPA World Safety Conference and Exposition. National Fire Protection Association (NFPA): Boston, MA.

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Gorbett, G. (2008). *Computer Fire Modeling for Fire Investigations.* National Fire, Arson & Explosion Investigation one day Pre-Program Seminar. National Association of Fire Investigators (NAFI) and National Fire Protection Association (NFPA): Sarasota, FL.

Gorbett, G. (2008). *Fire Dynamics and Fire Pattern Analysis.* National Fire, Arson, and Explosion Investigation Training Program. National Association of Fire investigators (NAFI) and National Fire Protection Association (NFPA): Sarasota, FL.

Gorbett, G. (2009). *Computer Fire Modeling for Fire Investigations.* National Fire, Arson & Explosion Investigation one day Pre-Program Seminar. National Association of Fire Investigators (NAFI) and National Fire Protection Association (NFPA): Sarasota, FL.

Gorbett, G. (2009). *Advanced Fire Dynamics.* National Fire, Arson, and Explosion Investigation Training Program. National Association of Fire investigators (NAFI) and National Fire Protection Association (NFPA): Sarasota, FL.

Gorbett, G. (2009). *Enclosure Fire Dynamics.* Vehicle Fire, Arson, and Explosion Investigation training program. National Association of Fire Investigators (NAFI) and National Fire Protection Association (NFPA): Lexington, KY.

Gorbett, G. (2009). *Enclosure Fire Dynamics.* Saskatchewan Fire Marshal's Association: Saskatchewan, Canada.

Gorbett, G. (2009). *Origin Determination.* Saskatchewan Fire Marshal's Association: Saskatchewan, Canada.

Gorbett, G. (2009). *Heat and Flame Vector Analysis.* Saskatchewan Fire Marshal's Association: Saskatchewan, Canada.

Gorbett, G. (2009). *Origin Determination-Case Study.* Saskatchewan Fire Marshal's Association: Saskatchewan, Canada.

Gorbett, G. (2011-2018). *Applied Fire Dynamics*
- IAAI State Chapters: NH; CT; MN; Rogue Valley, OR; OR; KY; Central TX; FL/GA; WA; GA; OH; IN
- IAAI – International Training Conference
- NAFI-Newport Beach, CA; Boston, MA; Charlotte, NC; Sarasota, FL; St. Louis, MO; Dallas, TX; Detroit Arson Investigators

Invited Lecturer by the National Emergency Management Agency (NEMA) Republic of Korea. Lectured on *Computer Fire Modeling for the Fire Investigator*. Hoseo University, Asan, South Korea, 2012.

Gorbett, G. (2015). *Report Writing for Fire Investigators*, Kirkland, WA

Invited Lecturer by Fiat Chrysler Automobiles – China. Lectured on *Fire Investigation Seminar, Vehicle Fire Investigation Seminar*. Beijing, China, 2015.

Gorbett, G. (2017). *Use of Damage for Fire Investigations.* International Association of Arson Investigators, International Training Conference, Las Vegas, NV.

Gorbett, G., Hicks, W. (2017). *Use of Damage for Fire Investigations, Fire Dynamics, Vehicle Fire Investigations, Explosion Investigation, Electricity and Electrical Systems, Fuel Gas Systems.* Jamaica Constabulary Force – University of West Indies

Gorbett, G., Babrauskas, V., Quintiere, J., Svare, M. (2018). *Origin Determination Panel Discussion.* International Association of Arson Investigators, International Training Conference, Frisco, TX

Gorbett, G. (2018). *Use of Damage for Fire Investigations,* Georgia Fire Investigation Seminar, Savannah, GA.

Gorbett, G. (2018). *Fire Dynamics and Fire Patterns.* Forensic Fire Analysis Institute, Richmond, KY.

Gorbett, G. (2018). *Use of Damage for Fire Investigations* and *Fire Dynamics*. Ohio Arson School, Columbus, OH.

Gorbett, G., McCoy, J. (2018, 2019). *Strategies to Disqualify and Bolster and Expert Witness*. Portland, ME-Maine Event; Memphis, TN-Propane Gas Defense Association.

Gorbett, G. (2018). *What to Expect from the Defense-Arson for Prosecutors*. Bureau of Alcohol, Tobacco, and Firearms (ATF), Huntsville, AL

Gorbett, G. (2019). *Strategies for Cause Determination, including x-ray analysis.* Forensic Fire Analysis Institute. Richmond, KY.

Gorbett, G. (2019-2023). *What to Expect from the Defense Expert*. Bureau of Alcohol, Tobacco, and Firearms (ATF), Huntsville, AL

Gorbett, G. (2022). *Fire patterns and Fire Dynamics.* Washington State IAAI, Leavenworth, WA.

Gorbett, G. (2023). *Ventilation Generated Fire Patterns – fuels, flow paths, and current research..* Texas Forensic Science Commission, Texas Scientific Advisory Workgroup, Dallas, TX.

Gorbett, G. (2023). *Ventilation Generated Fire Patterns – fuels, flow paths, and current research..* Georgia Fire Investigation Association, Atlanta, GA.

Gorbett, G. (2024). *Use of Fire Dynamics for Origin Determination.* International Association of Arson Investigators, Las Vegas, NV.

Gorbett, G. (2024). *Fire Dynamics Analysis; Fire Pattern Analysis; Origin Determination.* Saskatchewan Fire Marshal's Office. Saskatchewan, Canada.

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EXPERT TESTIMONY

Deemed qualified to give expert deposition and trial testimony in many fire and explosion related fields, including these specific topics:

> Fire Science and Technology
> Fire Testing
> Fire Dynamics
> Fire Investigation Methodology
> Computer Fire Modeling
> Use of Computer Fire Modeling in Fire and Explosion Investigations
> Fire Protection Engineering Concepts and Applications
> Building and Fire Codes and Standards
> Natural gas migration and gas flow modeling

HONORS AND RECOGNITION

Appointed to **Phi Eta Sigma Honor Society**. American Universities and Colleges.

All-American Scholar Award, **National Collegiate Award.** United States Achievement Academy.

Member, **Championship Team**. (2003). of the National Crime Scene Investigation Competition at the National Conference of the American Criminal Justice Association (ACJA): Orlando, FL.

Elected to the **Board of Directors** for the National Association of Fire Investigators (2004-2017).

Awarded the **John Charles Wilson Scholarship**. (2006). International Association of Arson Investigators. Awarded the **John L. Jablonsky Scholarship**. (2009), and the **Percy Bugbee Scholarship**. (2012) from National Fire Protection Association.

Ranked as one of the nation's top 10 Fire Science instructors in the South, and as one of the nation's top 15 Arson Investigation Professors in the United States by forensiccolleges.org

Awarded a Citation from the House of Representatives of the Commonwealth of Kentucky for being "one of the nation's top five fire experts during a "60 Minutes" segment on a deadly hotel fire, and was named in a list of Top 10 Fire Science Instructors in the South and as one of the nation's Top 15 Arson Investigation Professors"

Awarded a Citation from the House of Representatives of the Commonwealth of Kentucky for being "appointed to the Crime Scene/Death Investigation Scientific Area Committee's (SAC's) Fire Scene and Explosives Subcommittee within the Organization of Scientific Area Committees (OSAC) through the National Institute of Standards and Technology (NIST).

Inducted into Salamander, the Fire Protection Engineering Honor Society. An inductee of the Worcester Polytechnic Institute, Gamma Chapter of Salamander, for graduate students.

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INVITED LECTURES

Gregory Gorbett serves as a regular staff instructor of the four annual NFPA/NAFI co-sponsored National Fire, Arson, and Explosion Investigation Training Programs: The National Fire, Arson, and Explosion [basic] Training Program; the National Advanced Fire, Arson, and Explosion Instigation Training Program; The National Seminar on Fire Analysis Litigation; and the International Symposium of Fire Investigation. Over the years, Gregory Gorbett has had the opportunity to participate as an instructor, lecturer or speaker in programs of study and educational activities involving institutions of higher education and post-secondary training, and groups sponsoring fire related training including the following:

- The National Association of Fire Investigators
- The International Association of Arson Investigators
- The National Fire Protection Association
- Roger Williams University
- The British Fire Service College
- Heriot-Watts University
- The University of Cincinnati
- International Symposium on Fire Investigation Science and Technology
- Hoseo University & National Emergency Management Agency – South Korea
- Fiat Chrysler Automotive – Beijing, China
- Bureau of Alcohol, Tobacco, and Firearms

FIRE AND EXPLOSION PROTECTION RELATED TRAINING

Fire Investigation and The Importance of NFPA 921, sponsored by SIU division of State Farm Insurance, presented by Daniel Churchward, Bloomington, Illinois, June 2002.

The Importance of NFPA 921, sponsored by American Criminal Justice Association chapter at Tri-State University of Angola, IN, presented by Ryan Cox, April 10, 2003.

Vehicle Fire, Arson, & Explosion Investigation Science & Technology Training Program, co-sponsored by NAFI, Eastern Kentucky University, and NFPA; Lexington, KY; 2003-2015

National Advanced Fire, Arson, Explosion Investigation Science and Technology Program, co-sponsored by NAFI, NFPA and Eastern Kentucky University, 2004-2017
- Eastern Kentucky University
- Dallas, TX; Denver, CO; Newport Beach, CA; Boston, MA; Charlotte, NC; St. Louis, MO; Detroit, MI
- Topics include: fire science, fire dynamics, documentation of fire and explosion scenes, origin determination, cause determination, fire patterns, witness interviews, arc mapping, evaluating ignition sources, evaluating ignition sequence, competency of ignition sources, electricity and electrical fires, failure analysis, fuel gas systems, explosion investigations.

National Fire, Arson & Explosion Investigation Program, co-sponsored by NAFI and NFPA, Sarasota, FL, 2004-2016

National Seminar on Fire Analysis Litigation, co-sponsored by NAFI and NFPA, Sarasota, FL, 2004-2010

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4th Annual Technical Working Group on Fire and Explosions Symposium for Fire and Explosion Debris Analysis and Scene Investigation, sponsored by the University of Central Florida, Orlando, Florida, November 2004.

Fire Investigation training co-sponsored by IAAI and CFITrainer.net:
- *Ethics and the Fire Investigator*, co-sponsored by IAAI and CFITrainer.net, 2005.
- *Digital Photography for Fire Investigators Webinar,* presented by John Twomey, 2005.
- *Introduction to Fire Dynamics and Modeling*, presented by Dan Madrzykowski, 2005.
- *MagneTek: A Case Study In the Daubert Challenge,* presented by Guy Burnette, 2005.
- *The Scientific Method for Fire and Explosion Investigation*, 2005.
- *An Analysis of the Station Nightclub Fire*, 2006.
- *Investigating Motor Vehicle Fires,* 2006.
- *Accreditation, Certification, and Certificates*, 2021
- *Arc Mapping Basics*, 2011
- *Charleston Sofa Super Store Fire*, 2012
- *Introduction to Evidence*, 2011
- *Investigating Natural Gas Systems*, 2020
- *NFPA 921 and 1033 2014 Editions: Important Revisions*, 2021
- *Postflashover Fires*, 2009
- *The Deposition Part 1: Format, Content, and Preparation,* 2021
- *The Impact of Ventilation in Building Structures on Fire Development*, 2020
- U*nderstanding Fire Through the Candle Experiments*, 2009
- *Wildland Fires Investigation*, 2021

CFPS Primer Course, co-sponsored by Maryland Fire Rescue Institute (MFRI) and NFPA, Orlando, Florida, December 2005.

20th Annual Fire Investigation Training Program, sponsored by International Association of Arson Investigators (IAAI) Rhode Island Chapter, Newport, RI, May, 2006

NFPA World Safety Conference and Exposition, sponsored by NFPA: 2004-2013.
- An Analysis of the Station Nightclub Fire
- The Effectiveness of Smoke Detectors in Awakening Sleeping Occupants Delegate to the International Symposium on Fire Investigation Science and Technology, ISFI 2006, held at the University of Cincinnati, June 26-29, 2006.
- "Hourglass" Burn Patterns: A Scientific Explanation for their Formation
- Full-Scale Room Burn Patterns Study
- Advanced Fire Pattern Research Project
- The Mythology of Arson Investigation
- The Pitfalls, Perils, & Reasoning Fallacies of Fire Cause Determination in the Absence of Proof: The Negative Corpus Methodology
- *NFPA 921: Fire and Explosion Investigation*, sponsored by National Fire Protection Association (NFPA), presented by Daniel Churchward and Dennis Smith, Salt Lake City, Utah
- *Flashover and Fire Analysis – A Discussion of the Practical Use of Flashover Analysis*, sponsored by National Fire Protection Association (NFPA), presented by Patrick M. Kennedy, Salt Lake City, Utah
- *Committee Leadership Conference*, sponsored by National Fire Protection Association (NFPA), presented by Philip J. DiNenno and Leona Attenasio Nisbet, Salt Lake City, Utah

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- *Standards Forum*, sponsored by National Fire Protection Association (NFPA), presented by Phillip J. DiNenno, Maureen Brodoff, and Casey Grant, Salt Lake City, Utah
- Training Versus Education: The Case for the Development of a National Curriculum for Fire Investigators
- The Role of Smoke Detectors in Forensic Fire Investigation and Reconstruction
- The Use of Animation as an Aid in the Presentation of Results of Computational Fluid Dynamics Modeling in Fire Reconstruction and Analysis
- The Use of Toxicity Data in the Reconstruction and Analysis of Fires
- *Citizens and Fire Fighters – How They Die and How We Can Stop It*, sponsored by National Fire Protection Association (NFPA), presented by Meri-K Appy and Dennis Compton, Salt Lake City, Utah

Attendee to the Fire and Materials International Conference, held in San Francisco, CA, January 29-31, 2007.

International Symposium on Fire Investigation Science and Technology.
- University of Cincinnati-Cincinnati, OH: 2006 & 2008
- University of Maryland-Adelphi, MD: 2010, 2012, & 2014
- Scottsdale, AZ: 2016

Xtreme Industrial Fire and Hazard Training – Williams/Tyco Fire and Hazard Control, Beaumont, TX, 2014

Fire Department Instructors Conference (FDIC) – Indianapolis, IN: 2008-2023

Organization of Scientific Areas Committees (OSAC)-NIST / DOJ, Norman, OK, 2014; Baltimore, MD, 2015; Phoenix, AZ, 2016; Leesburg, VA, 2017; Chicago, IL, 2018; Houston, TX, 2019; Norman, OK, 2020

International Association of Arson Investigators, International Training Conference, 2010-2018

Master Samurai Technical Courses – Core Appliance Repair Training, 2020-2021

Forensic Fire Analysis Institute (FFAI) – Richmond, KY 2019-2021: *Strategies for Cause Determination, including x-ray analysis; Strategies for Origin Determination; Gas and Electrical Appliance Evaluation; Fuel Gas Seminar-Natural Gas and Propane Gas Systems, failure analysis, and appliances.*

COMPUTER FIRE MODELING

Gregory Gorbett has completed the Fire Dynamics Simulator (FDS) course from the Seneca College, Fire Protection Engineering Technology Program; and the Fire Dynamics and Computer Fire Modeling courses from Worcester Polytechnic Institute.

Some of the models most commonly applied to fire investigation issues are: ASET (Available Safe Egress Time) and ASET-B; CFAST (Fire and Smoke Transport); FPEtool (Fire Protection Engineering Tools, including FIREFORM and the zone model Fire Simulator); and the field model FDS (Fire Dynamics Simulator) and its companion graphics program, SMOKEVIEW.

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Gregory Gorbett has been deemed qualified to give expert deposition and trial testimony in computer fire modeling in a many jurisdictions in the United States and Canada. He has instructed and authored on computer fire modeling, including:

Computer Fire Modeling Course for National Association of Fire Investigators (NAFI) and National Fire Protection Association (NFPA) Co-sponsored National Fire, Arson & Explosion Investigation One day Pre-Program Seminar, Sarasota, FL, Denver, CO, Newport Beach, CA, August, 2003-August 2016.

Taught Computer Fire Modeling Course for Eastern Kentucky University and National Association of Fire Investigators (NAFI) Co-sponsored National Advanced Fire, Arson, and Explosion Investigation Science and Technology Program, Richmond, KY, March 2004-March 2009.

Author of, *"Fire Dynamic Simulator (FDS) and Smokeview Training"*, published by the National Fire Protection Association (NFPA) in *Fire News,* September 2004.

Gorbett, G. (2008). Plenary Paper: *Computer Fire Modeling for Fire Investigations.* International Symposium on Fire Investigation, at the University of Cincinnati.

Computer Fire Modeling Course for National Association of Fire Investigators (NAFI) and Saudi ARAMCO. One day Pre-Program Seminar, Dhammam, Saudi Arabia, 2008.

Developer of Computer Fire Modeling curriculum for Oklahoma State University – School of Fire Protection and Safety, Bachelor of Science Fire Protection and Safety Engineering Technology degree, Stillwater, OK, 2009.

Icove, D., Gorbett, G., Birdwell, J., and Merck, R. (2010). *Fire Modeling: Best Practices for Constructing Academic High Performance Computing Clusters*. International Symposium on Fire Investigation, at the University of Maryland.

Gorbett, G. (2011). *Computer Fire Modeling for Fire Investigations*. Journal of Canadian Association of Fire Investigators. Vol. 1.

Invited Lecturer by the National Emergency Management Agency (NEMA) Republic of Korea. Lectured on *Computer Fire Modeling for the Fire Investigator*. Hoseo University, Asan, South Korea, 2012.

Invited Lecturer by the Korean Fire Investigation Association (KFIA) Republic of Korea. Lectured on *Computer Fire Modeling for the Fire Investigator*. Seoul, South Korea, 2014.

Invited Lecturer by the Fiat, Chrysler Automobiles (FCA). Lectured on *Computer Fire Modeling for the Fire Investigator*. FCA, Beijing, China, 2015.

Invited Lecturer by the Jamaica Constabulary Force-University of West Indies. Lectured on *Computer Fire Modeling for the Fire Investigator*. Kingston, Jamaica, 2017.

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